

U.S. Department of Energy
Technical Qualification Program

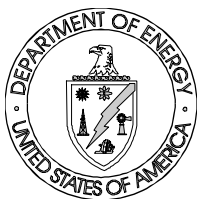
Technical Training Topical Area

Study Guide

For the

*Occupational Safety
Qualification Standard*

August 1996



Competency 1.5 Occupational safety personnel shall demonstrate a working level knowledge of the purpose, general content, development, and performance of worker occupational safety training.

1. Supporting Knowledge and Skills

- a. Identify safety training requirements addressed in applicable regulations or Department of Energy Orders.
- b. Discuss the basics of training development techniques, emphasizing the importance of using behavioral objectives.
- c. Discuss the considerations that must be addressed in the development of a training course. Describe the various types (and uses) of training material and techniques.
- d. Discuss the basics of evaluating a training course or program and the importance of, and methods for, evaluating the effectiveness of occupational safety training.
- e. Discuss the role and limitations of worker training in a comprehensive safety program.

2. Self-Study Activities

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:
`gopher://VM1.HQADMIN.DOE.GOV:70/00/doemenu1/directiv/251cross.asc`
 - Below are two web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://cted.inel.gov/cted/index.html	DOE Standards, Guides, and Orders.
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations



Section 5.0

Read Chapter V, DOE Order 3790.1B, *Federal Employee Occupations Safety and Health Program*.

Read Pages I-4 through I-5, DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities*.

EXERCISE 1.5-A Identify safety training requirements addressed in applicable regulations or Department of Energy Orders.

Read pages 9 through 15 of DOE-STD-1077-94, U.S. Department of Energy Standard, *Training Accreditation Program Standard, Requirements and Guidelines*.

EXERCISE 1.5-B Discuss the basics of training development techniques, emphasizing the importance of using behavioral objectives.

Read sections 1.0, 3.0, 4.0, and 6.0 of DOE-HDBK-1078-94, U.S. Department of Energy Handbook, *Training Program Handbook: A Systematic Approach to Training*.

EXERCISE 1.5-C Discuss the considerations that must be addressed in the development of a training course. Describe the various types (and uses) of training material and techniques.

EXERCISE 1.5-D Discuss the basics of evaluating a training course or program and the importance of, and methods for, evaluating the effectiveness of occupational safety training.

EXERCISE 1.5-E Discuss the role and limitations of worker training in a comprehensive safety program.

3. Summary

Training provides personnel with the knowledge and skills necessary to perform their jobs safely, effectively, and efficiently with minimal supervision. Excellence in training and qualification is particularly important in an industry where adherence to proper work practices and procedures is essential to public health and safety.

Line and training managers share the responsibility of ensuring that all training programs are effective. Training and job qualification should be viewed as an integral part of everyone's job function.



4. Exercise Solutions

EXERCISE 1.5-A Identify safety training requirements addressed in applicable regulations or Department of Energy Orders.

ANSWER 1.5-A Safety training requirements for DOE Federal employees are listed in Chapter V, Safety and Health Training, of DOE Order 3790.1B, for the following groups:

- Top Management
- Representatives of Employees
- Collateral Duty Safety Personnel
- Supervisors
- Employees
- Safety and Health Professionals

Safety training requirements for contractor employees are listed on pages I-4 through I-5 of DOE Order 5483.1A for the following topics:

- Observe the DOE-prescribed OSHA standards applicable to their work
- Report emergencies and respond to warning signals
- Requirements outlined by the DOE safety and health poster
- Employee rights, protections, and obligations
- Monitoring the workplace for radiation exposure and known toxic materials or harmful physical agents
- Access to personal safety, health, and medical records

EXERCISE 1.5-B Discuss the basics of training development techniques, emphasizing the importance of using behavioral objectives.

ANSWER 1.5-B Basic training development techniques are outlined in the following five elements of the systematic approach to training.

Analysis ensures training activities are oriented to job requirements by identifying the specific tasks involved in a given job. Training requirements are determined by analyzing the job and its component tasks. Organizational needs are also assessed to determine the resources required to support identified training requirements.



Section 5.0

Design begins with developing terminal and enabling objectives based on information gathered from the analysis phase. Skills and knowledge associated with performing a task well are translated into enabling objectives. The objectives are then organized into instructional units and sequenced to aid the learning process. The objectives become the guides for the development of learning strategies, course content, and training materials. Additional design activities include identifying the appropriate training setting, developing test items and examinations (also done in the next phase), and documenting key components of this phase.

Development is the actual preparation of lesson plans, instructor guides, training aids, and training materials. Formulation of additional enabling objectives and revisions of test items and objectives may also occur. Both technical and instructional reviews of the products are conducted, and changes are made as necessary to ensure the content is both technically and educationally correct and relevant.

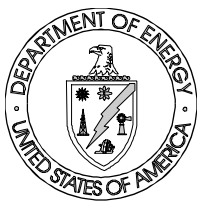
Implementation consists of resource allocation, planning, and scheduling, as well as the actual conduct of training. Resource allocation includes assigning instructors and support staff and scheduling training in facilities.

Evaluation is the critical feedback loop to ensure that the training meets its objectives. Feedback from instructors, trainees, evaluators, and supervisors is reviewed for its potential refinement of future training. Evaluation is a continuing action that occurs throughout the entire process and beyond. Evaluation results are translated into change actions or recommendations based on different criteria such as adequacy of content, tests, presentation, or documentation, and post-training job performance.

EXERCISE 1.5-C Discuss the considerations that must be addressed in the development of a training course. Describe the various types (and uses) of training material and techniques.

ANSWER 1.5-C Adults learn best when facts and concepts are built upon one another and are closely related. The sequence should allow each terminal objective to build upon and provide information necessary to support the next terminal objective. There are numerous ways to sequence instruction:

- Follow the sequence normally used on the job
- Show the whole picture; discuss each part, in turn; and then return to discuss the whole picture



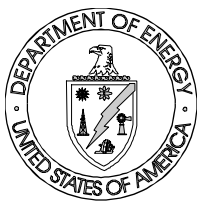
- Move from known to unknown
- Discuss simple to complex
- Discuss concrete to abstract

Basic considerations that must be addressed in the development of training activities include the following:

- Sequence of learning objectives
- Select appropriate settings using and/or adapting existing materials
- Selecting appropriate media

The following matrix lists some advantages and limitations for various training settings:

Training Settings Matrix		
Setting	Advantages	Limitations
Self-paced/ self-directed instruction	<ul style="list-style-type: none">• Close supervision is not required.• It is useful as an adjunct to other methods of learning.• The trainee controls the pace and flow.• The trainee can pursue an interest not shared by other trainees.• The trainee controls the number of examples and level of difficulty.	<ul style="list-style-type: none">• The trainee must be self-motivated.• The goal of the learning session must be clearly stated or understood by the trainee.• Effectiveness may be based on the trainee's ability to make strategic decisions regarding instructional support.
On-the-job training (OJT)	<ul style="list-style-type: none">• It is useful for developing job-specific training.• It acts as a continuation of instruction received in formal courses.• It reinforces classroom training when the job is complex.	<ul style="list-style-type: none">• The job setting may not be conducive to learning (interruptions, noisy, too dangerous for trial-and-error mistakes).• Support materials such as job aids are often a necessary adjunct.• Qualified subject matter experts must be available to conduct the OJT.



Training Settings Matrix		
Setting	Advantages	Limitations
Laboratory/ workshop	<ul style="list-style-type: none">• It is useful if multiple job conditions (environment, system, equipment, etc.) are required for task performance.• It permits application of course material and basic skills in a hands-on environment.• It is effective when used to train basic skills that support task performance.• It is useful when tasks, elements, and skills require hands-on practice to achieve mastery.• It is useful when OJT is impractical.	<ul style="list-style-type: none">• It usually requires fewer trainees per trainer.• It may require special facilities or equipment.• It is time-consuming because trainees must be given the opportunity to practice until they reach an acceptable proficiency.
Classroom	<ul style="list-style-type: none">• It works well for initial presentation of fundamental and basic theoretical knowledge.• It is suitable when large quantities of basic knowledge must be presented.• It works well when other training settings are not suitable or available.• It is useful if there are no critical resource constraints--everything required for training can be presented in a classroom setting.• It is useful if the subject matter changes frequently.	<ul style="list-style-type: none">• Classroom training cannot replicate OJT experience.• Trainee involvement is limited.• It is difficult to check learning before testing.• It should not be used as a sole method when teaching job tasks.• Trainee attention may wander.

Prior to using established materials, consider the following:

- Does the instruction meet my objectives?
- Is the instruction appropriate for my target audience?
- Is the instructional content technically accurate? Will it need updating?
- Are the trainer and trainee activities, methods, and media appropriate for my objectives?
- Will the media and materials easily transfer to my needs, or will it take a good deal of effort to make them useful?



- Are there copyright issues or ownership issues?
- Is the software used for materials development still available or easily translated?

The media selected should be evaluated in terms of cost and practicality for use in the training program. Factors to be considered in these evaluations include the following:

- Projected life-cycle costs of the selected media
- Budget
- Appropriateness of the media for the number of trainees
- Shelf life of the media versus impact (videos usually have a shelf-life of two to three years)
- Lead time required to produce or procure the media

EXERCISE 1.5-D Discuss the basics of evaluating a training course or program and the importance of, and methods for, evaluating the effectiveness of occupational safety training.

ANSWER 1.5-D Evaluation of a training course and/or activity typically includes the following criteria, as a minimum:

- Are the materials prepared at a level of skills and knowledge appropriate to the trainees?
- Are the materials clearly written and presented so the trainee can complete the required learning activities?
- Do the materials reflect the learning objectives of the desired program?
- Are the materials consistent with other materials used in the training program or the mastery of the learning objectives?
- Do the materials conform to the learning activities of the desired program?
- Are the materials practical for use in the given facility situation?

The facility's training organization and programs should be evaluated periodically to determine whether they are achieving the established goals and objectives. The effectiveness of training programs to produce qualified personnel should also be evaluated periodically. This should be accomplished by reviewing operating occurrences, interviewing job incumbents and first-line supervisors, observing operations, etc. The results of these evaluations, if used correctly, will help ensure a facility of safe, efficient, and reliable operations.



The following considerations should be emphasized when evaluating training and qualification programs:

- The responsibility for monitoring indicators, analyzing data, and approving revisions is clearly defined.
- The training department is alerted to facility operating, maintenance, and industrial safety experiences.
- Communication on training effectiveness occurs between plant supervisors and the training department.
- Employee opinion of the equality and effectiveness of training is collected periodically.
- The training department is alerted to employee performance errors.
- The training department meets with maintenance and operations supervisors and engineers to determine potential training problems.
- Training uses facility inspection and evaluation reports to guide program revisions.
- Facility modifications and procedure changes are monitored for training consequences.
- Training monitors industry operating and maintenance experiences for program impacts.
- Regulatory changes are reviewed for training consequences.
- Program performance data are analyzed.
- Proposed changes are reviewed by appropriate facility and training personnel.
- Training changes are tracked.

EXERCISE 1.5-E Discuss the role and limitations of worker training in a comprehensive safety program.

ANSWER 1.5-E The cornerstone of safe operation of the Department of Energy (DOE) facilities is personnel performing the day-to-day functions which accomplish the facility mission. Training that is conducted efficiently and effectively and is directly related to the needs of the job (i.e., performance-based training) is fundamental to safe operation.

The limitation of worker training is that it is only effective for resolving performance discrepancies which are caused by a lack of skill or knowledge.